



Application of silicone based elastomers for manufacturing of Green Fiber Bottle

Saxena, Prateek; Bissacco, Giuliano

Published in:
Book of Abstracts

Publication date:
2017

Document Version
Peer reviewed version

[Link back to DTU Orbit](#)

Citation (APA):
Saxena, P., & Bissacco, G. (2017). Application of silicone based elastomers for manufacturing of Green Fiber Bottle. In *Book of Abstracts* (pp. 62). [P17] Department of Chemical and Biochemical Engineering.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

P17: Application of silicone based elastomers for manufacturing of Green Fiber Bottle

Prateek Saxena; Giuliano Bissacco

Department of Mechanical Engineering, Technical University of Denmark

Due to ever-increasing demand of sustainable products, eco-friendly packaging solutions are finding their importance in the paper packaging industry [1]. Green Fiber Bottle (GFB) is an alternative to plastic, glass and metal based packaging for beverages. The manufacturing of paper bottle is a two-stage process, where the wood fibers are first thermoformed in the desired shape followed by drying of the formed geometry [2]. To ensure the robustness of the bottle and to avoid shrinkage of cellulose fibers, the wet-formed bottle is pressurized using a silicone core. The core is inserted inside the drying tool and inflated. This keeps the wet bottle under pressure thereby enhancing formation of good hydrogen bonds, and hence providing good strength. The feasibility of the tool design concept is supported with Finite Element Model. The hyperelastic behaviour of silicone is defined by the deformation energy function (W). To simulate the inflation action of the core, Yeoh's model is used for modelling of W. The strength of the GFB is correlated with the pressure the bottle can hold and the cut off burst pressure from experiments is also reported in this work.

References

1. Didone, M., Saxena, P., Meijer, E. B., Tosello, G., Bissacco, G., McAloone, T. C., Howard, T. J. Moulded Pulp Manufacturing: Overview and Prospects for the Process Technology. Packaging Technology and Science. 2017, DOI: 10.1002/pts.2289
2. Søllner, K., A system and a method for producing a molded article, such as a bottle, 2016, WO2016/055073 A1

[Click here to return to program](#)